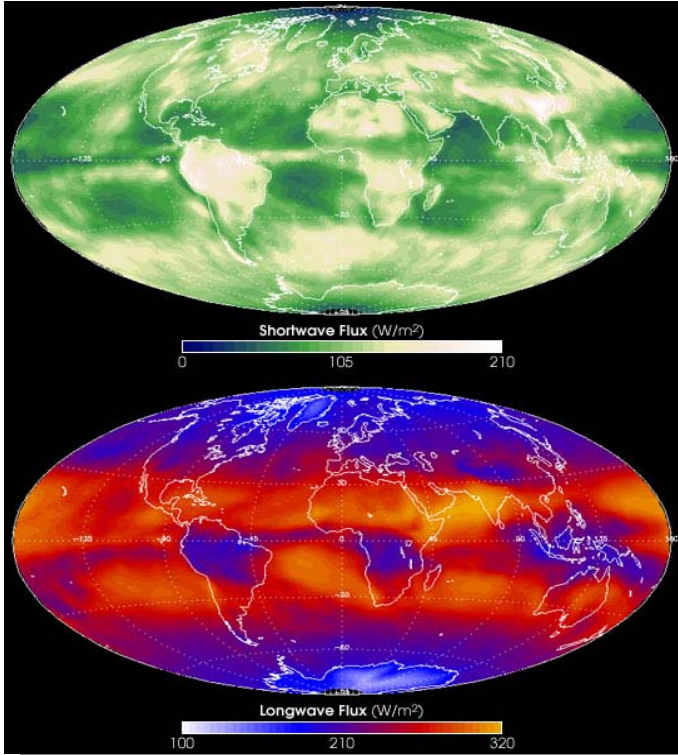


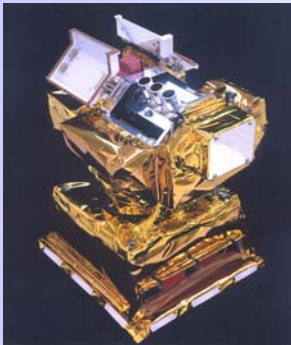
## Cloud and Earth Radiant Energy System

measures the reflected shortwave and Earth emitted radiances. The Cloud and Earth Radiant Energy System (CERES) mission data will be provided by the Flight Model 5 instrument flying on the NPOESS Preparatory Project (NPP) and Flight Model 6 on the first National Polar-orbiting Operational Environmental Satellite System (NPOESS) satellite. The CERES measurements seek to develop and improve weather forecast and climate models prediction, to provide measurements of the space and time distribution of the Earth's Radiation Budget (ERB) components, and to develop a quantitative understanding of the links between the ERB and the properties of the atmosphere and surface that define that budget. CERES consists of three broadband radiometers that scan the earth from limb to limb. The three spectral channels cover the spectral regions of 0.3 to > 50  $\mu\text{m}$  (total radiation channel), 8  $\mu\text{m}$  to 12  $\mu\text{m}$  (atmospheric window channel) and 0.3  $\mu\text{m}$  to 5  $\mu\text{m}$  (shortwave channel).

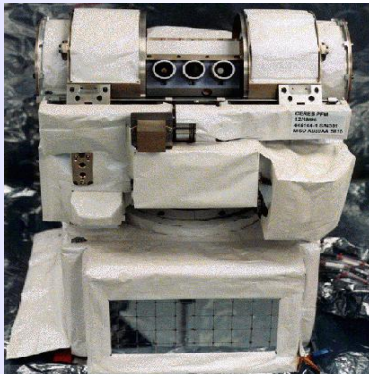
Mass, kg	57
Avg Power, W	50
Avg Data Rate, kbps	10.5



Monthly Global Longwave and Shortwave Radiation Maps



ERBE Scanner circa 1984

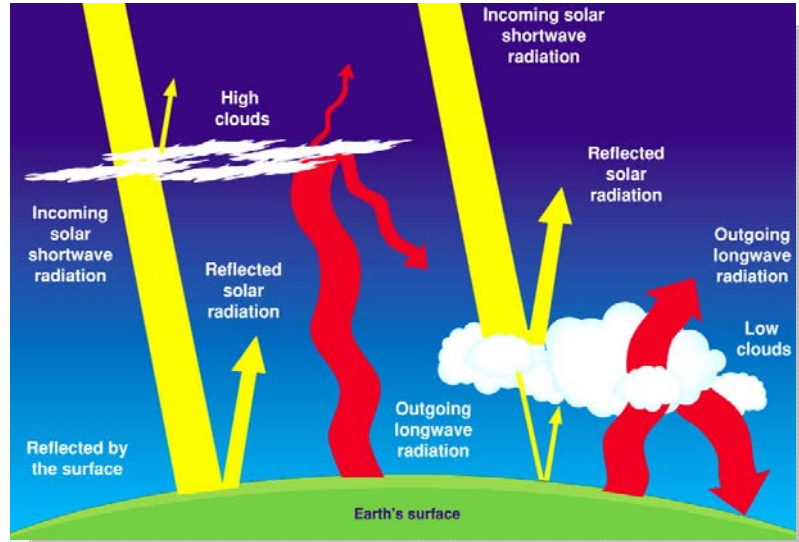


CERES Protoflight Model 1995



CERES Flight Models 1999

## CERES Measures Earth's Radiant Energy Balance



02S00220-T0051b-154

### CERES Mission Objectives

- Provides a consistent database of accurately known fields of Earth's reflected solar and Earth's emitted thermal radiation. Satisfies four NPOESS EDRs, in combination with other instruments :

Net Solar Radiation, Top of the Atmosphere  
Downward Longwave Radiation at the Surface  
Downward Shortwave Radiation at the Surface  
Outgoing Longwave Radiation, Top of the Atmosphere

- The CERES EDRs are essential to understanding Earth weather & climate.

Measurement of clear sky fluxes aids in monitoring climate forcing and feedback mechanisms involving surface radiative characteristics.

These data are fundamental inputs to atmospheric and oceanic energetics.

They provide a basic input to extended range (10 day or longer) weather forecasting.

They provide a measure of the effect of clouds on the energy balance, one of the largest sources of uncertainty in our modeling of the climate.

The legacy to CERES builds on the highly successful ERBE (Earth Radiation Budget Experiment) Scanners flown on NOAA S/C CERES Sensors have flown on EOS .